WHAT IS CLAIMED IS:

1. A system for improving transmission of DSL signals over a local loop, the system comprising:

a loop extender capacitively coupled to the local loop, the loop extender including

a plurality of upstream complex impedances coupled in parallel,

a plurality of downstream complex impedances coupled in parallel,

a first upstream filter/amplifying element coupled to the plurality of upstream complex impedances via a first switch, and

a first downstream filter/amplifying element coupled to the plurality of downstream complex impedances via a second switch.

2. The system of claim 1, wherein the first switch is configured to select one of the plurality of complex upstream impedances to approximately match the local loop impedance in a first direction along the local loop.

3. The system of claim 2, wherein the first direction is directed from the loop extender to a central office along the local loop.

4. The system of claim 1, wherein the second switch is configured to select one of the plurality of complex downstream impedances to approximately match the local loop impedance in a second direction.

5. The system of claim 4, wherein the second direction is directed from the loop extender to a customer premises along the local loop.

6. The system of claim 1, wherein the loop extender further includes:

at least one additional upstream filter/amplifying element coupled in parallel to the first upstream filter/amplifying element; and

at least one additional downstream filter/amplifying element coupled in parallel to the first downstream filter/amplifying element.

7. The system of claim 6, wherein a third switch selects either the first upstream filter/amplifying element or one of the at least one additional upstream filter/amplifying elements to provide upstream DSL signal amplification.

8. The system of claim 7, wherein the selection of either the first upstream filter/amplifying element or one of the at least one additional upstream filter/amplifying elements is based upon local loop length measured from the loop extender to a customer premises.

9. The system of claim 6, wherein a fourth switch selects either the first downstream filter/amplifying element or one of the at least one additional downstream filter/amplifying elements to provide downstream DSL signal amplification.

10. The system of claim 9, wherein the selection of either the first downstream filter/amplifying element or one of the at least one additional downstream filter/amplifying elements is based upon local loop length measured from the loop extender to a central office.

11. The system of claim 6, wherein the loop extender further includes:

a first transformer coupled to the plurality of upstream complex impedances, a first inverting buffer, and either the first downstream filter/amplifying element or one of the at least one additional downstream filter/amplifying elements via a third switch for coupling the plurality of upstream complex impedances, the first inverting buffer, and either the first downstream filter/amplifying element or one of the at least one additional downstream filter/amplifying elements via the third switch to the local loop; and

a second transformer coupled to the plurality of downstream complex impedances, a second inverting buffer, and either the first upstream filter/amplifying element or one of the at least one additional upstream filter/amplifying elements via a fourth switch for coupling the plurality of downstream complex impedances, the second inverting buffer, and either the first upstream filter/amplifying element or one of the at least one additional upstream filter/amplifying elements via the fourth switch to the local loop.

12. The system of claim 11, wherein the loop extender further includes:

a POTS loading coil adapted to be coupled to the local loop for improving transmission of POTS band signals over the local loop; and

a diagnostic/control unit coupled to the local loop for providing communications, control, and diagnostic functionality.

13. The system of claim 12, wherein the diagnostic/control unit includes:

a modem coupled to the local loop for communication with a central office;

an analog multiplexer/analog-to-digital converter (AMADC) for controlling the first, second, third, and fourth switches via switch control lines; and

a diagnostic/control processor (DCP) coupled to the modem and the AMADC for processing control signals received via the modem and sending the control signals to the AMADC.

14. The system of claim 13, wherein the first transformer is coupled to the local loop via a first bypass relay switch and the second transformer is coupled to the local loop via a second bypass relay switch.

15. The system of claim 14, further comprising a bypass relay for coupling the first and second bypass relay switches to the DCP.

16. The system of claim 15, wherein the DCP upon receiving control signals from the central office, decouples the first and second transformers from the local loop by activating a deactivated bypass relay.

17. The system of claim 15, wherein the DCP upon receiving control signals from the central office, couples the first and second transformers to the local loop by deactivating an activated bypass relay.

18. A method for improving transmission of DSL signals over a local loop, comprising the steps of:

configuring a loop extender with

a plurality of upstream complex impedances coupled in parallel;

a plurality of downstream complex impedances coupled in parallel;

a plurality of upstream filter/amplifying elements coupled in parallel and coupled in series with the plurality of upstream complex impedances; and

a plurality of downstream filter/amplifying elements coupled in parallel and coupled in series with the plurality of downstream complex impedances.

19. The method of claim 18, wherein the method further includes the step of selecting one of the plurality of complex upstream impedances to approximately match a local loop impedance in a first direction along the local loop.

20. The method of claim 19, wherein the first direction is directed from the loop extender to a central office along the local loop.

21. The method of claim 18, wherein the method further includes the step of selecting one of the plurality of complex downstream impedances to approximately match a local loop impedance in a second direction along the local loop.

22. The method of claim 21, wherein the second direction is directed from the loop extender to a customer premises along the local loop.

23. The method of claim 18, wherein the method further includes the step of selecting one of the plurality of upstream filter/amplifying elements to provide upstream DSL signal amplification.

24. The method of claim 23, wherein the selection of one of the plurality of upstream filter/amplifying elements is based upon local loop length measured from the loop extender to a customer premises.

25. The method of claim 18, wherein the method further includes the step of selecting one of the plurality of downstream filter/amplifying elements to provide downstream DSL signal amplification.

26. The method of claim 25, wherein the selection of one of the plurality of downstream filter/amplifying elements is based upon local loop length measured from the loop extender to a central office.

27. The method of claim 18, further including the steps of:

configuring the loop extender with

a first transformer for coupling the plurality of upstream complex impedances, a first inverting buffer, and one of the plurality of downstream filter/amplifying elements to the local loop; and

a second transformer for coupling the plurality of downstream complex impedances, a second inverting buffer, and one of the plurality of upstream filter/amplifying elements to the local loop.

28. The method of claim 27, further including the steps of:

improving transmission of POTS band signals over the local loop via a POTS loading coil coupled to the local loop; and

providing communications, control, and diagnostic functionality via a diagnostic/control unit coupled to the local loop.

29. The method of claim 28, wherein the step of providing communications, control, and diagnostic functionality includes the steps of:

communicating with a central office via a modem coupled to the local loop;

processing control signals received via the modem;

selecting one of the plurality of downstream complex impedances based upon the processed control signals;

selecting one of the plurality of upstream complex impedances based upon the processed control signals;

selecting one of the plurality of upstream filter/amplifying elements based upon the processed control signals; and

selecting one of the plurality of downstream filter/amplifying elements based upon the processed control signals.

30. The method of claim 29, wherein the method further includes the step of uncoupling the first transformer and the second transformer from the local loop in accordance with the processed control signals.

31. A system for improving transmission of DSL signals over a local loop, the system comprising:

selectable line termination and equalization (SLTE) DSL amplification circuitry capacitively coupled to the local loop via bypass relay switches;

a POTS loading coil adapted to be coupled to the local loop for improving transmission of POTS band signals over the local loop; and

a diagnostic/control unit coupled to the local loop for receiving and processing control signals from a central office, coupled to the bypass relay switches via a bypass relay for controlling the bypass relay switches, and coupled to the SLTE DSL amplification circuitry via a plurality of switch control lines for controlling the SLTE DSL amplification circuitry.

32. The system of claim 31, wherein the SLTE DSL amplification circuitry includes:

a plurality of upstream complex impedances coupled in parallel and selectable via a first switch;

a plurality of downstream complex impedances coupled in parallel and selectable via a second switch;

a plurality of upstream filter/amplifying elements coupled in parallel and selectable via a third switch;

a plurality of downstream filter/amplifying elements coupled in parallel and selectable via a fourth switch;

a first transformer for coupling the plurality of upstream impedances, the fourth switch, and a first inverting buffer to the local loop;

a second transformer for coupling the plurality of downstream impedances, the third switch, and a second inverting buffer to the local loop;

a first non-inverting buffer for coupling the first switch and the first inverting buffer to the plurality of upstream filter/amplifying elements; and

a second non-inverting buffer for coupling the second switch and the second inverting buffer to the plurality of downstream filter/amplifying elements.

33. The system of claim 32, wherein the first switch is controlled via a first switch control line, the second switch is controlled via a second switch control line, the third switch is controlled via a third switch control line, and the fourth switch is controlled via a fourth switch control line.

34. The system of claim 33, wherein the diagnostic/control unit, in response to the control signals received from the central office, instructs the first switch to select one of the plurality of complex upstream impedances.

35. The system of claim 34, wherein the one of the plurality of complex upstream impedances selected approximately matches the local loop impedance in a first direction along the local loop.

36. The system of claim 35, wherein the first direction is directed from the SLTE DSL amplification circuitry to the central office along the local loop.

37. The system of claim 33, wherein the diagnostic/control unit, in response to the control signals received from the central office, instructs the second switch to select one of the plurality of complex downstream impedances.

38. The system of claim 37, wherein the one of the plurality of complex downstream impedances selected approximately matches the local loop impedance in a second direction along the local loop.

39. The system of claim 38, wherein the second direction is directed from the SLTE DSL amplification circuitry to a customer premises along the local loop.

40. The system of claim 33, wherein the diagnostic/control unit, in response to the control signals received from the central office, instructs the third switch to select one of the plurality of upstream filter/amplifying elements.

41. The system of claim 40, wherein the one of the plurality of upstream filter/amplifying elements selected is based upon local loop length measured from the SLTE DSL amplification circuitry to a customer premises.

42. The system of claim 33, wherein the diagnostic/control unit, in response to the control signals received from the central office, instructs the fourth switch to select one of the plurality of downstream filter/amplifying elements.

43. The system of claim 42, wherein the one of the plurality of downstream filter/amplifying elements selected is based upon local loop length measured from the SLTE DSL amplification circuitry to the central office.

44. A method for improving transmission of DSL signals over a local loop, comprising the steps of:

transmitting control signals and DSL signals over the local loop;

providing DSL signal amplification via selectable line termination and equalization (SLTE) DSL amplification circuitry coupled to the local loop;

receiving the control signals via a diagnostic/control unit (DCU) coupled to the local loop;

processing the control signals;

selecting SLTE DSL amplification circuitry switch states in accordance with the processed control signals;

sampling DSL signals within the SLTE DSL amplification circuitry;

processing the sampled DSL signals;

selecting SLTE DSL amplification circuitry switch states in accordance with the processed sampled DSL signals to improve SLTE DSL amplification circuitry performance; and

uncoupling SLTE DSL amplification circuitry from the local loop in accordance with the processed control signals.

45. A system for improving transmission of DSL signals, the system comprising:

means for transmitting control signals and DSL signals;

means for providing DSL signal amplification coupled to the means for transmitting;

means for receiving the control signals coupled to the means for providing DSL signal amplification;

means for processing the control signals generating processed control signals;

means for improving performance of the means for providing DSL signal amplification in accordance with the processed control signals;

means for sampling the DSL signals within the means for providing DSL signal amplification;

means for processing the sampled DSL signals, generating processed sampled DSL signals;

means for improving performance of the means for providing DSL signal amplification in accordance with the processed sampled DSL signals; and

means for uncoupling the means for providing DSL signal amplification from the means for transmitting in accordance with the processed control signals.